PCT / IB 03 / 03714
31. 07. 03

#2

REGISTRY OF PATENTS
SINGAPORE

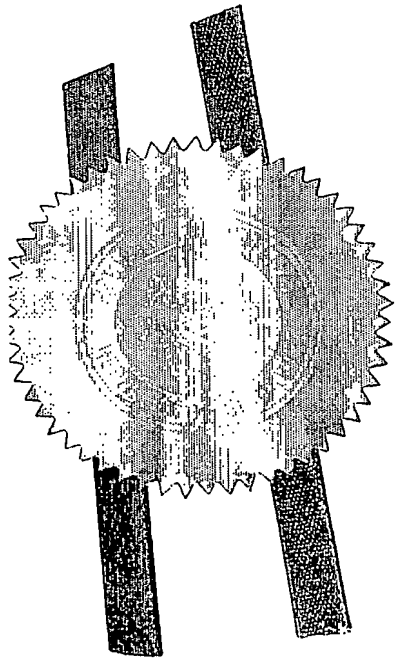
This is to certify that the annexed is a true copy of the following international application as filed with the Registry as the receiving Office and of any corrections thereto.

Date of Filing	:	26 AUG 2002
Application Number	:	PCT/SG02/00202 [withdrawn]
Applicant(s) / Proprietor(s) of Patent	:	PHILIPS ELECTRONICS SINGAPORE PTE LTD; KONINKLIJKE PHILIPS ELECTRONICS N.V.
Title of Invention	:	ELECTRIC STEAMING DEVICE

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN COMPLIANCE WITH RULE 17.1(a) OR (b)

Tan Kar Leng (Ms)
Assistant Registrar
for REGISTRAR OF PATENTS
SINGAPORE

2 Jul 2003



HOME COPY

PCT REQUEST

PSG020021WOP

Original (for SUBMISSION) - printed on 26.08.2002 01:56:49 PM

0	**For receiving Office use only**	
0-1	International Application No.	PCT/SG 02 / 00202
0-2	International Filing Date	26 AUG 2002 (26-08-02)
0-3	Name of receiving Office and "PCT International Application"	REGISTRY OF PATENTS (SINGAPORE) PCT INTERNATIONAL APPLICATION
0-4	**Form - PCT/RO/101 PCT Request**	
0-4-1	Prepared using	PCT-EASY Version 2.92 (updated 01.06.2002)
0-5	**Petition** The undersigned requests that the present International application be processed according to the Patent Cooperation Treaty	
0-6	**Receiving Office (specified by the applicant)**	Intellectual Property Office of Singapore (RO/SG)
0-7	**Applicant's or agent's file reference**	PSG020021WOP
I	**Title of invention**	ELECTRIC STEAMING DEVICE
II	**Applicant**	
II-1	This person is:	applicant only
II-2	Applicant for	SG
II-4	Name	PHILIPS ELECTRONICS SINGAPORE PTE. LTD.
II-5	Address:	Attn. Mr. J. C. De Visser 620A Lorong 1 Toa Payoh TP2-2nd Floor 319762 Singapore Singapore
II-6	State of nationality	SG
II-7	State of residence	SG
II-8	Telephone No.	+65 7995021
II-9	Facsimile No.	+65 7995022

CONFIRMATION COPY

PCT REQUEST

PSG020021WOP

Original (for SUBMISSION) - printed on 26.08.2002 01:56:49 PM

III-1	Applicant and/or inventor	
III-1-1	This person is:	applicant only
III-1-2	Applicant for	all designated States
III-1-4	Name	KONINKLIJKE PHILIPS ELECTRONICS N.V.
III-1-5	Address:	Groenewoudseweg 1 NL-5621 BA Eindhoven Netherlands
III-1-6	State of nationality	NL
III-1-7	State of residence	NL
III-1-8	Telephone No.	+31 40 2743444
III-1-9	Facsimile No.	+31 40 2743489
III-1-11	Applicant's registration No. with the Office	GPA 02/0007
V	Designation of States	
V-1	Regional Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	EP: AT BE CH&LI CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE TR and any other State which is a Contracting State of the European Patent Convention and of the PCT (except BG CZ EE SK)
V-2	National Patent (other kinds of protection or treatment, if any, are specified between parentheses after the designation(s) concerned)	SG
V-5	Precautionary Designation Statement In addition to the designations made under items V-1, V-2 and V-3, the applicant also makes under Rule 4.9(b) all designations which would be permitted under the PCT except any designation(s) of the State(s) indicated under item V-6 below. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit.	
V-6	Exclusion(s) from precautionary designations	NONE
VI	Priority claim	NONE
VII-1	International Searching Authority Chosen	European Patent Office (EPO) (ISA/EP)

PCT REQUEST

PSG020021WOP

Original (for SUBMISSION) - printed on 26.08.2002 01:56:49 PM

VIII	Declarations	Number of declarations	
VIII-1	Declaration as to the identity of the inventor	-	
VIII-2	Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent	-	
VIII-3	Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application	-	
VIII-4	Declaration of inventorship (only for the purposes of the designation of the United States of America)	-	
VIII-5	Declaration as to non-prejudicial disclosures or exceptions to lack of novelty	-	
IX	Check list	number of sheets	electronic file(s) attached
IX-1	Request (including declaration sheets)	4	-
IX-2	Description	4	-
IX-3	Claims	1	-
IX-4	Abstract	1	EZABST00.TXT
IX-5	Drawings	2	-
IX-7	TOTAL	12	
	Accompanying items	paper document(s) attached	electronic file(s) attached
IX-8	Fee calculation sheet	✓	-
IX-11	Copy of general power of attorney	reference no.	-
IX-17	PCT-EASY diskette	-	Diskette
IX-19	Figure of the drawings which should accompany the abstract	1	
IX-20	Language of filing of the international application	English	
X	Signature of applicant, agent or common representative		
X-1	Name (LAST, First)	VAN DER VEER, J. L. (Authorized Representative)	
X-2	Capacity		

FOR RECEIVING OFFICE USE ONLY

10-1	Date of actual receipt of the purported international application	26 AUG 2002 (26-08-02)
10-2	Drawings:	
10-2-1	Received	
10-2-2	Not received	
10-3	Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application	
10-4	Date of timely receipt of the required corrections under PCT Article 11(2)	
10-5	International Searching Authority	ISA/EP

PCT REQUEST

PSG020021WOP

Original (for SUBMISSION) - printed on 26.08.2002 01:56:49 PM

10-6	Transmittal of search copy delayed until search fee is paid	

FOR INTERNATIONAL BUREAU USE ONLY

11-1	Date of receipt of the record copy by the International Bureau	

Electric steaming device

Electric steaming device comprising a housing, a steam generator having a base, heating means for heating said base of the steam generator, a water reservoir, at least one steam outlet opening, means for feeding water from the water reservoir into the steam generator, at least one passageway for conveying steam from the steam generator toward the at least one steam outlet opening.

Such a steaming device is for example known from US 3263350 which describes an electric steam iron. In this iron the means for feeding water from the water reservoir into the steam generator comprises a valve which permits controlled amounts of water in the form of droplets to enter the chamber of the steam generator by gravity flow. The desired quantities of steam to be generated depends on the one hand of the amounts of water released by the valve and thus depends upon the extent of the valve opening which can be controlled by the user and on the other hand by the temperature of the base which is thermostatically controlled. Water released by the valve drips on the base at one location and from this location it flows by gravity along the base for evaporation. Steam generated in this way is generally rather dry. For easily removing wrinkles, the garment should be moistened efficiently, which means that for a good ironing result the steam discharged from the outlet openings of an iron should contain more water than obtained by the usual steam generation. From US 2762143 it is known to insert water into the generated steam in order to obtain such a wet steam. The water is inserted in a steam passage outside the steam generator. Also for a device like a facial sauna as described in WO 00/66063 it is desirable to generate wet steam or water vapor.

It is an object of the invention to increase the steam production rate. It is another object of the invention to generate a wet steam.

According to the invention, these objects are achieved in that the means for feeding water into the steam generator comprises at least one spray nozzle for spraying water

onto the base of the steam generator. The advantage of this arrangement is that water is sprayed over a relatively large surface of the base with very fine water droplets and thus steam is continuously generated over a large surface. The result is that per unit of time the steam production is much higher than obtained by the known devices. Some of the sprayed water in the form of very fine droplets is mixed with and taken with the generated steam. In this way a kind of wet steam, also referred to as mist, is obtained which is, for example, favorable to moisten garment in an ironing process or to obtain vapor for a facial treatment or for steam cleaning. Contrary to known devices (US 2762143), wet steam is already generated inside the steam generator. Another advantage is that steaming starts almost immediately after the spray of water is inserted in the steam generator.

In a preferred embodiment of the steaming device, the heating means for heating the base of the steam generator comprises a resistive track of a thick film printed circuit. With a thick film heating track applied to the base a uniform heating of the base is obtained. The heated base reaches very rapidly the desired temperature for steaming. Moreover, the construction of the steam generator can be made lightweight.

In a further preferred embodiment the means for feeding water into the steam generator comprises an electric pump. By means of an electric pump dosing of the amount of water to the nozzle and thus the amount of water spray can easily be adjusted. Also the location of the water reservoir relative to the steam generator can be freely chosen and is not dependent on gravity.

An example of the steaming device according to the invention is a steam iron having a soleplate, heating means for heating the soleplate, a plurality of steam outlet openings provided in the soleplate, wherein the passageway for conveying the generated steam to the steam outlet openings comprises at least one steam distribution channel provided in the heatable soleplate. Such a steam iron has a separate heating means, preferably also a resistive track of a thick film printed circuit, which the temperature can be controlled independently from the heating means for heating the base of the steam generator.

Another example of the steaming device is a facial sauna.

These and other aspects of the invention will now be apparent from and elucidated with reference to the embodiments described hereinafter:

Fig.1 is a diagrammatic cross-sectional view of an iron according to a first embodiment of the electric steaming device and

Fig.1 is a diagrammatic cross-sectional view of a facial sauna according to a second embodiment of the electric steaming device.

The iron shown in Fig.1 comprises a housing 1, a soleplate 2 attached to the lower side of the housing, an electric heating element 3 for heating the soleplate 2, a water reservoir 4, a steam generator 5, an electric pump 6 and a control device 7. A duct 8 connects the water reservoir 4 with the pump 6 and a duct 9 connects the pump 6 with the steam generator 5. A spray nozzle 10 is provided at the outlet of the duct 9. The steam generator 5 is roof-shaped with sloping sidewalls 11 and a base 12. Edges 13 of the sidewalls 11 are connected to the base 12. The sidewalls can be made of high temperature resistant plastics or composite material. The base can be made of aluminum.

The edges are thermally insulated from the base by means of a gasket 14. The spray nozzle 10 is provided in the apex of the roof-shaped steam generator 5. The steam generator 5 is provided with an outlet 14, which is arranged in a sidewall 11 at a distance above the base 12. The soleplate 2 is provided with a plurality of steam outlet openings 16. A passageway 17 connects the outlet 15 of the steam generator with the steam outlet openings in the soleplate. A part of this passageway is arranged in the soleplate to form a steam distribution channel 18. The lower side of the base 12 is provided with one or more resistive tracks 19 of a thick film printed circuit. The track 19 is electrically isolated from the base 12. Heating of the tracks can be controlled by the control device 7. A heat shield 20 separates the water reservoir 4 and pump 6 from the steam generator 5 and the soleplate 2.

In operation, after powering the iron, the user can start the pump 6 by means of an operating knob 21. Water is pumped from the water reservoir 4 to the nozzle 10. A spray of water 22 is injected on the heated base 12 of the steam generator 5 to continuously and instantaneously generate steam 23. Some of the sprayed water in the form of very fine droplets is mixed with and taken with the generated steam toward the outlet 16. In this way wet steam 24 is obtained which flows through the passageway 17 and the distribution channel 18 to the steam outlet openings 16. By means of the operating knob 21 (or another operating knob) and the control device 7 the amount of sprayed water 22 can be controlled, for example with pulse or duty cycle control of the pump 6. The outlet 15 of the steam generator 5 is arranged at a distance above the base 14 to avoid any drippings of water through the steam outlet openings 16. Test have shown that with a thick film heating element of 1500 W and a

surface area of the base 12 of about 42 cm2, the steam production rate is 48 gram per minute which is much higher than can be obtained by the existing household irons.

A second embodiment of an electric steaming device is shown in Fig.2 and concerns a facial sauna. The facial sauna is constructed for generating and delivering water vapor for treatment of the facial skin. The facial sauna comprises an upper housing part 101 and a base part 102. The upper housing part 101 can be mounted on or removed from the base part 102. A button 103 can be operated for locking or unlocking these parts. A water reservoir 104 and a pump 106 are accommodated in the base part 102. A steam generator 105 is arranged in the housing 101, above the base part 102. A heat shield 120 separates the water reservoir 104 and the pump 106 from the steam generator. A duct 108 connects the water reservoir 104 with the pump 106 and a duct 109 connects the pump 106 with the steam generator 105. A spray nozzle 110 is provided at the outlet of the duct 109. The steam generator 105 has a similar construction as the steam generator 5 described in the first embodiment shown in Fig.1. A base 112 of the steam generator 105 is heated by means of a resistive track 119 of a thick film printed circuit. The steam generator is provided with two outlets 115. Passageways 117 connect the outlets 115 with a chamber 118. The housing 101 is provided with a vapor delivery nozzle 116a having a vapor (steam) outlet opening 116, which communicates with the chamber 118. A condensate receptacle 125 is provided inside the chamber 118. Reference numeral 126 indicates a removable additive cartridge for containing aromatic substances. Aromatic odour escapes through passages 127 in the upper wall of the cartridge and enters the chamber 118 to be mixed with the vapor.

The operation of the facial sauna is similar to that of the steam iron in the previous embodiment. A spray of water 122 is injected on the heated base 112 of the steam generator 105 to instantaneously generate steam 123. Some of the sprayed water is mixed with and taken with the steam toward the outlets 115. The obtained wet steam or water vapor 124 enters the chamber 118 and flows to the outlet opening 116 of the vapor delivery nozzle 116a. The amount of vapor and how much water is mixed with the steam depends on the power of the heating track 119 and on amount of water sprayed 122 onto the base 112. It might happen that vapor condenses in the chamber 118. This condensate is collected in the receptacle 125. By removing the upper housing part 101 this receptacle can be emptied.

CLAIMS:

1. Electric steaming device comprising a housing, a steam generator having a base, heating means for heating said base of the steam generator, a water reservoir, at least one steam outlet opening, means for feeding water from the water reservoir into the steam generator, at least one passageway for conveying steam from the steam generator toward the at least one steam outlet opening, characterized in that the means for feeding water into the steam generator comprises a spray nozzle for spraying water onto the base of the steam generator.

2. Electric steaming device as claimed in claim 1, characterized in that the heating means for heating the base of the steam generator comprises a resistive track of a thick film printed circuit.

3. Electric steaming device as claimed in claim 1 or 2, characterized in that the means for feeding water into the steam generator comprises an electric pump.

4. Electric steaming device as claimed in claim 1, 2 or 3, characterized in that the device is a steam iron with a soleplate, heating means for heating the soleplate, a plurality of steam outlet openings provided in the soleplate and that the passageway for conveying the generated steam to the steam outlet openings comprises at least one steam distribution channel provided in the heatable soleplate.

5. Electric steaming device as claimed in claim 1, 2 or 3, characterized in that the device is a facial sauna.

ABSTRACT:

The invention relates to an electric steaming device, such as a steam iron or a facial sauna, having a steam generator (5) with a heatable base (12). According to the invention water is sprayed onto the heatable base (12) via a nozzle (10) to generate steam (22). Some of the sprayed water (23) is mixed with the steam and taken with the steam toward the steam outlet opening (16). The advantage is a high wet steam or vapor (24) production rate.

Fig.1

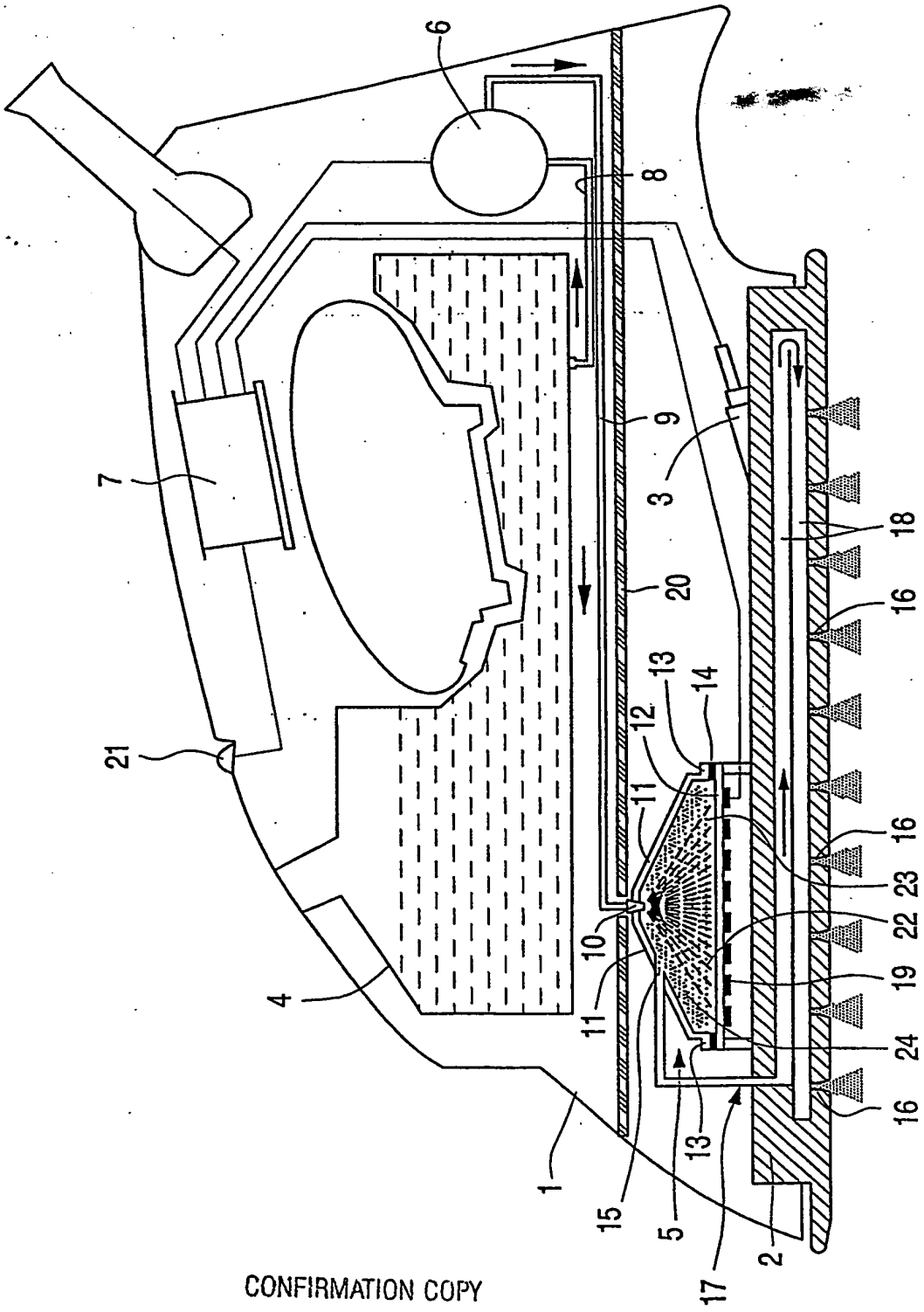


Fig.1

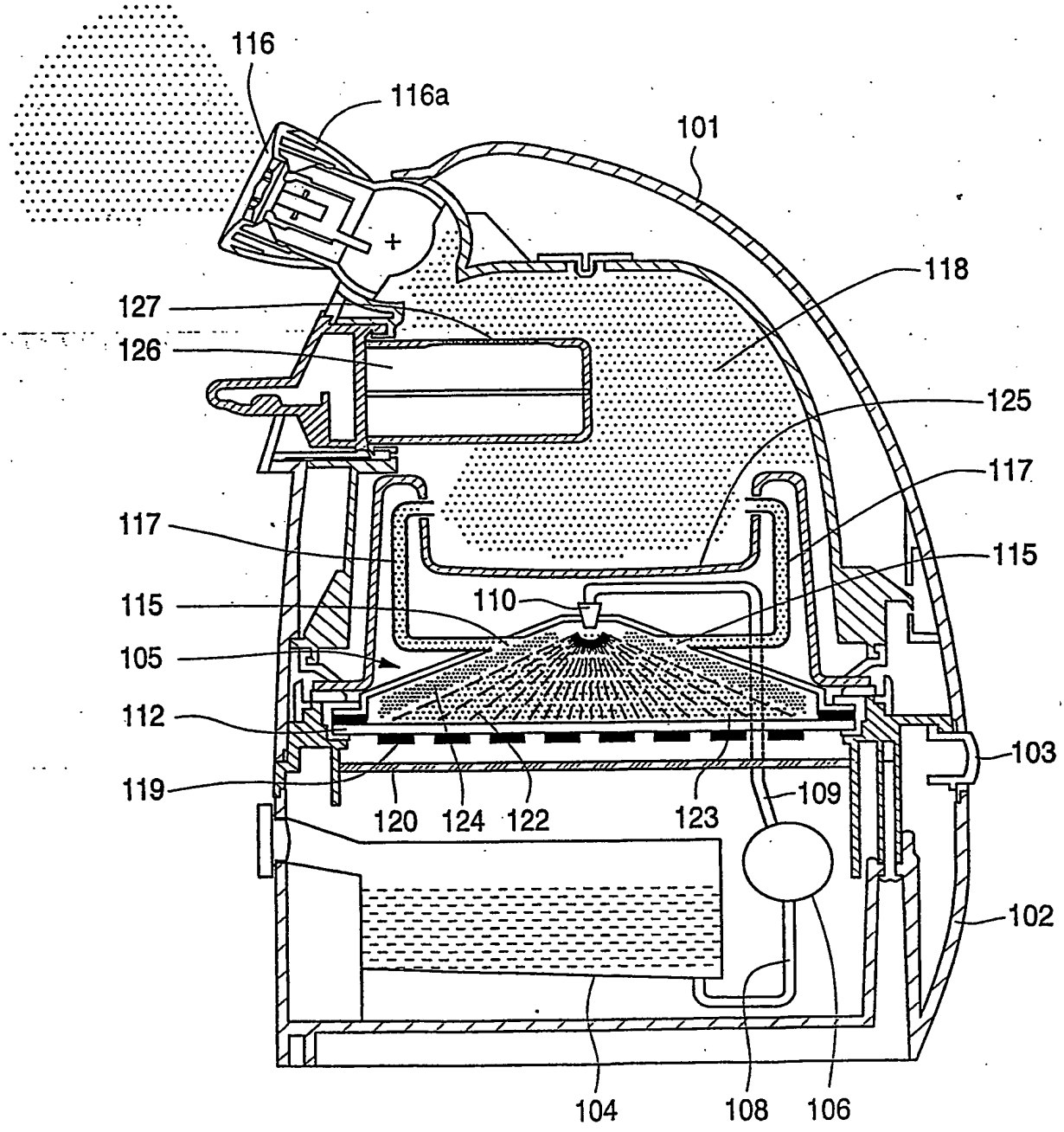

116
116a
101
118
127
126
125
117
117
115
115
110
105
112
103
119
109
120
124
122
123
102
104
108
106

Fig.2